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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,765	07/14/2003	Shunpei Yamazaki	740756-2631	4048

22204 7590 02/14/2006

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EXAMINER	
BUEKER, RICHARD R	
ART UNIT	**PAPER NUMBER**
1763	

DATE MAILED: 02/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/617,765	YAMAZAKI ET AL.	
	Examiner	Art Unit	
	Richard Bueker	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 14-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 14-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/16/05;12/12/05;*.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

In claims 38-42, the phrase "a the thermal radiation" should be changed to "thermal radiation" to correct a typographical error.

Claims 14, 15, 18, 19, 20, 23, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards (5,259,881) and Tanabe (6,132,280), and taken in further view of Makiguchi (5,850,071). Eida discloses a manufacturing apparatus (see Fig. 11, for example) comprising a transporting chamber 24, a film formation chamber 22 and a processing chamber 21. Eida teaches (see col. 18, lines 43-50, and col. 26, lines 19-48, for example) that the film formation chamber 22 can include a molybdenum heating boat as an evaporation source for organic EL coating material. Eida teaches that the processing chamber 21 is for vacuum heating a substrate that is to be coated with an organic EL layer. The substrate is vacuum heated prior to being coated in chamber 22 to remove moisture (water) from the surface of the substrate. Eida teaches that water is a contaminant that must be removed prior to the coating step. Eida teaches (col. 18, lines 43-54, particularly lines 51-54) that using the transporting chamber 24 as in Fig. 11 is desirable because the substrate is not exposed to the outside atmosphere between the vacuum heating step and the organic EL film formation step. Eida does not discuss a step of vacuum heating a plurality of substrates simultaneously. Edwards (see Figs. 1-3) teaches (col. 1. line 5 to col. 3, line 4) that it is well-known in the electronics manufacturing industry to vacuum preheat a substrate to remove absorbed impurities such as water vapor prior to coating and etching processes in the formation of integrated circuits. Edwards teaches that it is desirable to conduct the vacuum heating on a plurality of substrates in a batch chamber

to improve manufacturing efficiency. It would have been obvious to provide the manufacturing apparatus of Fig. 11 of Eida with a batch vacuum-heating chamber of the type taught by Edwards, for the desirable purpose of improving the manufacturing efficiency of Eida's apparatus. Also, Tanabe (see Fig. 1 and col. 12, lines 28-52, for example) teaches that an organic EL deposition apparatus should be provided with a batch-heating chamber to remove moisture from a plurality of substrates simultaneously. Tanabe provides even further motivation to provide the manufacturing apparatus of Fig. 11 of Eida with a batch vacuum-heating chamber of the type taught by Edwards. Also, Makiguchi (see Figs. 6-9 and col. 6, line 23 to col. 8, line 40) discloses a batch vacuum heater of the same type as disclosed by Edwards, and Makiguchi teaches that batch heating can successfully be performed by using a plurality of plate heaters to heat the plurality of substrates simultaneously. It would have been obvious to use a batch heater having a plurality of plate heaters to heat the substrates in Eida's apparatus, because Makiguchi teaches that his plate heaters will successfully perform the desired function of heating a plurality of substrates simultaneously. Also, Makiguchi teaches (see Fig. 8) that the substrate supports (82) can successfully and desirably be attached directly to the panel heaters (70), wherein the panel heaters (70) hold the plurality of plate heaters (76). It would have been obvious to use the prior art batch heating chamber of Figs. 6-9 of Makiguchi as the batch heating chamber suggested by Edwards or Tanabe, because Makiguchi teaches that his batch heating chamber design can successfully accomplish the batch heating that is desired by Edwards and Tanabe. Regarding newly added claims 39 and 40, it is noted that Makiguchi's heating plates 76

heat the substrates by radiant heating (see col. 8, lines 37-39 of Makiguchi, for example), which is inherently infrared radiation, or infrared light, as recited in claims 39 and 40. McCabe (Unit Operations of Chemical Engineering) is now cited of interest for his teaching (see page 389, lines 10-26, and Fig. 14-1) that thermal radiation at ordinary industrial temperatures has wavelengths in the infrared spectrum. Therefore, Makiguchi's radiant heating is inherently infrared light heating.

Claims 16 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards (5,259,881) and Tanabe (6,132,280), and taken in further view of Makiguchi (5,850,071) for the reasons stated above, and taken in further view of Spahn (6,237,529) or Kamata (JP 11-229123) who both disclose vacuum evaporation coating apparatus for forming organic EL films, wherein the apparatus includes a shutter having a hole. In Spahn, the closure plate (see element 20 of Figs. 1-6 or element 80 of Figs. 7 and 8) is a shutter having a hole. It is noted that the dictionary definition of "shutter" is "a movable cover, slide, etc. for an opening". The top plate of Spahn is a movable cover for the housing 10 or 70. Kamata also teaches the use of a shutter having an opening (see element 26A of Fig. 3, for example). It is also noted that the recited "evaporation source holder" reads on the vacuum chamber structure of Kamata, which holds the evaporation source 16 and the shutter 19. It would have been obvious to provide the apparatus of Eida with a shutter having a hole, for the reasons taught by either Spahn or Kamata.

Claims 17, 22, 24, 25, 27, 29-32, 34, 36, 37, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards

(5,259,881) and Tanabe (6,132,280), and taken in further view of Makiguchi (5,850,071) for the reasons stated above, and taken in further view of Yamamoto (6,179,923), who teaches the step of providing a film thickness monitor 15 (see Fig. 2 and col. 4, lines 28-36) adjacent to the evaporation source holder in an organic EL vacuum evaporation apparatus, and it would have been obvious to provide the vacuum evaporation apparatus of Eida with such a monitor for accurately controlling the coating process. Yamamoto also provides moving means for his source holder as recited in claims 24, 25, 27, and 29, to improve the speed of maintenance of his apparatus. It would have been obvious to provide the apparatus of Eida with source holder moving means for that reason.

Claims 28 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards (5,259,881) and Tanabe (6,132,280), and taken in further view of Makiguchi (5,850,071), and taken in further view of Yamamoto (6,179,923)for the reasons stated in the rejection of claims 24 and 31 above, and taken in further view of Spahn (6,237,529) or Kamata (JP 11-229123), who both disclose vacuum evaporation coating apparatus for forming organic EL films, wherein the apparatus includes a shutter having a hole. It would have been obvious to provide the apparatus of Eida with a shutter having a hole, for the reasons taught by either Spahn or Kamata.

Claims 24, 25, 31, 32, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards (5,259,881) and Tanabe (6,132,280), and taken in further view of Makiguchi (5,850,071) for the reasons stated

above, and taken in further view of Yamazaki (2001/0006827) (see Figs. 1-6), who teaches that an organic EL layer can be efficiently deposited by vacuum evaporation by moving the evaporation source holder. It would have been obvious to modify the apparatus of Eida by providing it with an organic EL evaporation chamber of the type taught by Yamazaki, including a means for moving the evaporation source holder, for the desirable purpose of improving deposition efficiency as taught by Yamazaki. Also, Yamazaki's source holder moves in multiple scans, which requires moving in multiple directions. This movement reads on moving in an x-axis direction and a y-axis direction as recited in claim 25.

Claims 25, 26, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards (5,259,881) and Tanabe (6,132,280), and taken in further view of Makiguchi (5,850,071), and in view of Yamazaki (2001/0006827) for the reasons stated in the previous paragraph, and taken in further view of Yamada (2002/0076847), Bennett (2,435,997) and/or Peng (6,641,674). Yamazaki (see paragraph 12) teaches that the vapor deposition source holder can be moved in multiple scans to coat a large board. Yamazaki does not state that "the evaporation source holder is rotated when switching between the x-axis direction and the y-axis direction" as recited in claim 26. Bennett also discloses a vapor deposition device in which a vapor deposition source holder is scanned in a manner analogous to that of Yamazaki. Bennett (see Figs. 1 and 2) makes clear that such a scanned vapor deposition source is moved in a plurality of directions, and it would have been obvious to provide the apparatus of Yamazaki with a vapor deposition

source holder moving means of the type taught by Bennett, because Bennett teaches that his vapor deposition source holder moving means can successfully coat a large substrate as desired by Yamazaki. Also, Bennett's source holder rotates when changing directions (see Figs. 2 and 4 of Bennett). Also, Yamada teaches an apparatus for vapor coating a large substrate with an organic EL layer in a manner analogous to that of Yamazaki. Yamada (see paragraph 105, for example) teaches in particular that an organic EL layer can successfully be deposited by using a single point source that is moved relative to the substrate. It view of this teaching by Yamada, it would have been expected and obvious to one skilled in the art that a vapor deposition source holder moving means of the type taught by Bennett could successfully be used to deposit an organic electroluminescent material coating layer of the type desired by Yamazaki. Peng is cited because he also teaches a process of vacuum evaporation of an organic EL layer, and he also teaches that it is desirable to move the evaporation source holder. Peng provides means for moving the source in plural directions, including up, down and rotationally, which includes components of motion along plural horizontal axis directions. It also would have been obvious to provide Peng's deposition chamber and source moving means for Eida's apparatus.

Claims 1, 2, 4, 5, 38 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki (2001/0006827) taken in view of Spahn (6,237,529) and Van Slyke (2003/0101937) and taken in further view of Eida (6,633,121), Edwards (5,259,881) and Makiguchi (5,850,071). Yamazaki (see Fig. 6, for example) discloses an apparatus comprising a loading chamber (604), a transporting chamber (601), plural

film formation chambers (606, 608, 610 and 612) and a processing chamber (605). Yamazaki teaches that each film formation chamber includes the structure shown in Figs. 2A and 2B, which includes a mask alignment means, a substrate holding means, an evaporation source holder and a means for moving the evaporation source holder. Spahn (see Figs. 1-8) and Van Slyke (see Figs. 2-8) disclose apparatus analogous to that of Yamazaki. Spahn discloses an evaporation source that includes a container that seals an evaporation material (see Figs. 1 and 2 and the paragraph bridging cols. 4 and 5). In Spahn's container, the top plate (20 or 80) is a shutter and also has a hole in it as recited in claim 4. Van Slyke (see Figs. 7 and 8) discloses a modification of Spahn's evaporation source, and teaches that a moving means should be provided to move the source relative to the substrate to be coated. Van Slyke is cited in the rejection to make clear that Spahn's evaporation source is of a type that is intended to be moved by a moving means. It would have been obvious to use a source container of the type taught by Spahn as the evaporation source of Yamazaki, because Spahn teaches that his evaporation source can successfully be used for forming an organic EL layer as desired by Yamazaki. Yamazaki teaches that a preprocessing chamber 605 can be included in his apparatus, but he does not discuss the use of a vacuum-heating chamber having plural plate heaters for his preprocessing chamber. Eida (see col. 18, lines 43-50, and col. 26, lines 19-48, for example), however, teaches that it is desirable to provide a vacuum-heating chamber as a preprocessing chamber in an organic EL manufacturing apparatus. Eida teaches that his vacuum-heating chamber desirably removes water vapor from a substrate to be coated. Also, Edwards teaches that bulk vacuum

preheating for vacuum heating a plurality of substrates simultaneously is desirable for mass production. Also, Makiguchi (see Figs. 6-9 and col. 6, line 23 to col. 7, line 25) discloses a batch vacuum heater of the same type as disclosed by Edwards, and Makiguchi teaches that batch heating can successfully be performed by using a plurality of plate heaters to heat the plurality of substrates simultaneously. It would have been obvious to use a batch heater having a plurality of plate heaters to heat the substrates in Eida's apparatus, because Makiguchi teaches that his plate heaters will successfully perform the desired function of heating a plurality of substrates simultaneously. Also, Makiguchi teaches (see Fig. 8) that the substrate supports (82) can successfully and desirably be attached directly to the panel heaters (70), wherein the panel heaters (70) hold the plurality of plate heaters (76). It would have been obvious to use the prior art batch heating chamber of Figs. 6-9 of Makiguchi as the batch heating chamber suggested by Edwards or Tanabe, because Makiguchi teaches that his batch heating chamber design can successfully accomplish the batch heating that is desired by Edwards and Tanabe. Regarding new claim 43, Yamazaki teaches the use of a vacuum pump such as a turbo pump coupled to the plurality of film forming chambers.

Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki (2001/0006827) taken in view of Spahn (6,237,529) and Van Slyke (2003/0101937) and taken in further view of Eida (6,633,121), Edwards (5,259,881) and Makiguchi (5,850,071), for the reasons stated in the preceding paragraph rejection, and taken in further view of Yamada (2002/0076847), Bennett (2,435,997) and/or Peng (6,641,674). Yamazaki (see paragraph 12) teaches that the vapor deposition source

holder can be moved in multiple scans to coat a large board. Yamazaki does not state that "the evaporation source holder is rotated when switching between the x-axis direction and the y-axis direction" as recited in claim 3. Bennett also discloses a vapor deposition device in which a vapor deposition source holder is scanned in a manner analogous to that of Yamazaki. Bennett (see Figs. 1 and 2) makes clear that such a scanned vapor deposition source is moved in a plurality of directions, and it would have been obvious to provide the apparatus of Yamazaki with a vapor deposition source holder moving means of the type taught by Bennett, because Bennett teaches that his vapor deposition source holder moving means can successfully coat a large substrate as desired by Yamazaki. Also, Bennett's source holder rotates when changing directions (see Figs. 2 and 4 of Bennett). Also, Yamada teaches an apparatus for vapor coating a large substrate with an organic EL layer in a manner analogous to that of Yamazaki. Yamada (see paragraph 105, for example) teaches in particular that an organic EL layer can successfully be deposited by using a single point source that is moved relative to the substrate. It view of this teaching by Yamada, it would have been expected and obvious to one skilled in the art that a vapor deposition source holder moving means of the type taught by Bennett could successfully be used to deposit an organic electroluminescent material coating layer of the type desired by Yamazaki. Peng is cited because he also teaches a process of vacuum evaporation of an organic EL layer, and he also teaches that it is desirable to move the evaporation source holder. Peng provides means for moving the source in plural directions, including up, down and rotationally, which includes components of motion along plural horizontal axis directions.

It also would have been obvious to provide Peng's deposition chamber and source moving means for Eida's apparatus.

Applicants' arguments regarding their newly added limitations have been considered and addressed in the new grounds of rejection stated above.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (571) 272-1431. The examiner can normally be reached on 9 AM - 5:30 PM, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parvis Hassanzadeh can be reached on (571) 272-1435. The fax phone

number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Richard Bueker
Primary Examiner
Art Unit 1763